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ABSTRACT

The purpose of this study was to determine faculty concerns about the changes in technology at Louisiana Tech University, specifically faculty office computers with Internet access. Participants were the 41 faculty members in the College of Education. The Stages of Concern Questionnaire (SoCQ) and the Faculty Development Technology Workshop Survey were used to gather data for the study. Many factors impinge on faculty's movement through the stages of concern; providing hands-on workshops and one-on-one assistance fosters movement through the stages for most faculty. Training, support, time, and leadership are necessary for the successful integration of technology into classrooms. Technology integration will require faculty who feel comfortable using the technology. It will also require changes in teaching methods and changes in their roles as teachers. Contains 12 references. (AEF)

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Faculty Adoption of Technology: Stages of Concern

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Multimedia, pentium computers with Windows95, Microsoft Office, and Internet access can be overwhelming for education faculty who are accustomed to using IBM PS2 Model 30-386 computers with 4MB RAM and 40MB harddrives with WordPerfect for DOS. Internet access was through huge, IBM mainframe terminals with blinking green cursors that repeatedly froze. In the past two years as new faculty were added, they received Pentium computers that lacked CD-ROM drives and sound cards, but did, however, have both 3.5" and 5.25" disk drives, or they received CD-ROM drives with no sound cards and 3.5" disk drives. Lack of technology and easy Internet access in the College has not kept all of the faculty from learning about and using technology. Some faculty have hiked across campus to the 10th floor of the library or to an engineering building to gain Internet access and to take faculty development courses on the Internet. Other faculty accessed the Internet through local service providers in their homes.

In the Spring of 1996, technology resources began to change when a technology grant was awarded and an accreditation visit from the National Council for Accreditation of Teacher Education (NCATE) was eminent. NCATE standards require that faculty be "knowledgeable about current practice related to the use of computers and technology and integrate them in their teaching and scholarship" (NCATE, 1995, p. 24). The Louisiana Board of Regents funded a technology grant that replaced the Apple IIe computer lab in the College of Education with a Macintosh computer lab. During Spring, 1997 university funds became available to wire the College for Internet access in offices, classrooms, and the Macintosh computer lab. Additionally, the Board of Regents funded a second technology grant that provided a networked statistics lab. Multimedia, pentium computers with Internet access were placed in faculty offices and networked laser printers were installed in Fall, 1997. Other grants provided for a technology-rich classroom, software, and peripherals, such as digital cameras. The state is funding a distance education classroom that will be installed in the College in Spring, 1998. The changes in the technology available in the College are having a profound impact on the faculty with their office computers having the most direct impact on them.

Faculty have very personal concerns about these changes which may be manifest as resistance to change. Resistance to change can be attributed to the following fears: 1) fear of change, 2) fear of time commitment, and 3) fear of appearing incompetent (Rutherford & Grana, 1995). Fear of change is evidenced by faculty members resisting relinquishing mainframe terminals, old computers, and old printers even though the new technology has been installed and they have been given personal instructions on its use. Fear of time commitment is manifest by faculty who indicate they would like to attend faculty workshops and enroll in faculty technology classes. However, they do not enroll in the classes because it takes so much time to learn to use technology, and because they have so many other things demanding their attention. Some faculty openly express their technological incompetence, others quietly whisper this fear, and others simply continue to avoid using technology. Faculty fears and concerns are affected by individual faculty personalities. Some faculty are willing to take risks, eager to learn new things, and flexible enough to cope with new technology. Other faculty are not.

Individual faculty convictions influence their willingness to adopt an innovation. This adoption usually involves a five stage process: 1) awareness of the innovation, 2) judgment of the value of the innovation, 3) decisions based on the judgment, 4) implementation, and 5) confirmation of the viability of the innovation based on personal decisions and in collaboration with others (Wells & Anderson, 1997). Faculty beliefs and experiences with the innovation impact their acceptance and use of the innovation. Only if they find the innovation personally relevant and of value to themselves will they use the innovation and explore ways to use the innovation with others. The acceptance of an innovation is highly personal and individual concerns about the innovation can hinder or even obstruct the change process (Linnell, 1994).

Innovation requires change, and a natural part of the change process is resistance. Resistance to technology integration in colleges of education is multifaceted (Roberts & Ferris, 1994; Cummings, 1996). Frequently encountered problems include: 1) lack of active support from the adminis-

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tration, 2) inadequate hardware and software, 3) faculty who do not want to take risks and make commitments, and 4) inadequate, on-going faculty development. Fortunately, most of these problems have been resolved in the College. Support from the college administration is evidenced by their working to obtain the funding to provide hardware, software, and wiring for Internet access. They have also been supportive of faculty efforts to secure grants to provide additional technology resources. The willingness of faculty to take risks and make commitments is on a continuum. Some faculty members use technology for their personal benefit, integrate it into their classes, and work collaboratively to share their knowledge of technology (Parker, 1997). Some faculty members use technology for their own benefit, but do not teach with technology. Then, there are those faculty members who are not technology users. Last year with the upgrading of the College computer lab, faculty development technology workshops were offered each month and will be offered throughout the year. Further, faculty are provided individual, personal assistance and assistance with their classes in the computer lab when requested. Successful implementation of an innovation requires not just technical support, but also support that addresses the affective concerns of those instituting the change (Linnell, 1994).

The Stages of Concern Questionnaire assesses the intensity of concerns experienced as an innovation is adopted (Hall, George, & Rutherford, 1977). These concerns occur in a natural, developmental sequence marked by stages. Since movement through these stages is developmental, not everyone achieves all of the stages. These stages include: 1) awareness, 2) informational, 3) personal, 4) management, 5) consequence, 6) collaboration, and 7) refocusing. The first four stages focus on internal concerns of the individual, and the last three stages focus on external concerns relating to how the innovation may impact their associates and their students. The awareness stage is indicative of a knowledge of the innovation with little or no involvement with the innovation. Characteristic of the informational stage is a desire to learn more about the innovation with little concern for its impacts on the individual. The personal stage is characterized by knowledge that the innovation personally affects the individual accompanied by uncertainty as to the demands of the innovation, uncertainty as to the individual's ability to meet the demands, and uncertainty as to the individual's role with the innovation. At the management stage, the individual's concern is with the amount of time required to use the innovation effectively and efficiently. At the next stage of development, internal concerns shift to external concerns. The consequence stage involves focusing attention on the impact of the innovation beyond the individual. This stage is followed by collaboration which sees the individual focusing efforts on using the innovation in coordination and cooperation with others. The final stage of development is refocusing, whereby the individual focuses on other ways to benefit from the innovation and explores alternatives to the innovation. It is expected that movement through the stages leads to a decrease in internal concerns with a corresponding increase in external concerns related to the innovation.

The purpose of this study is to determine faculty concerns about the changes in technology in the College, specifically their office computers with Internet access. *The Stages of Concern About an Innovation Questionnaire* [SoCQ] (Hall, George, & Rutherford, 1977) is being used to assess faculty concerns. Three questions frame this research. At what stages are the faculty in their concerns about using their computers with Internet access? What impact will faculty development technology workshops and one-on-one assistance have on their stages of concern? What changes will occur in the faculty's stages of concern overtime?

Methodology

Sample

The participants in this study are the 41 faculty members in the College of Education. Three departments constitute the College: 1)) Curriculum, Instruction and Leadership, 2) Psychology and Behavioral Science, and 3) Health and Physical Education.

Instruments

Two instruments are being used to gather data for this study: 1) Stages of Concern Questionnaire and 2) Faculty Development Technology Workshops Survey.

Stages of Concern Questionnaire. The SoCQ (Hall, George, & Rutherford, 1977) measures changes in concerns over time as an innovation is adopted. The questionnaire consists of 35 concerns based statements, five for each of the seven stages of concern assessed by the questionnaire. Responses to the statements are on a scale of 0 to 7 with 0 indicating a very low concern or irrelevant at the present time and 7 indicating a very high concern. The instructions direct the participants to indicate their present degree of concern for each statement. The original version of the questionnaire uses the word innovation, which for the purpose of this study was changed to "office computer with Internet access." For example, number 6 states "I have a very limited knowledge about the innovation." This statement was changed to read "I have a very limited knowledge about my office computer with Internet access."

Faculty Development Technology Workshops Survey. In order to best determine the needs of the faculty for technology workshops, a faculty development technology workshop survey was sent to the faculty members. The survey asks them to indicate if they are interested in workshops on software applications for word processing, presentations, statistical analysis, a mail reader, and Internet explorations. A blank line allows for them to indicate if there are any other workshops they are interested in attending.

Additionally, the survey asks what days of the week are convenient for them and whether they prefer morning, afternoon, or evening sessions. The survey also asks for volunteers to teach or help teach the workshops.

Procedure

In December copies of the Stages of Concern Questionnaire and the Faculty Development Technology Workshop Survey were distributed to faculty members. They were requested to anonymously complete the questionnaire and the survey, then return it to the researchers. The instructions on the questionnaire ask them to read each question and answer it in terms of their present concerns. Data from the questionnaire and the survey will be used to determine staff development needs, specifically what staff development is needed based on the faculty's levels of concern. During the remainder of the academic year, technology workshops will be offered to the faculty as well as one-on-one support. At the end of April, both the questionnaire and the survey will be redistributed to the faculty. This data will be used to determine growth in faculty stages of concern. Further, data from the questionnaire and the survey will be used to assist in planning the faculty development workshops to be offered during the following year and to help determine other ways to assist the faculty as they discover new ways to use the technology. Faculty will be at differing levels of concern and will need different types of support as they learn to use and teach with the available technology. Faculty development workshops will be more effective if they are tailored to address the immediate faculty concerns.

Data Analysis

Responses to the SoCQ will be tallied on the SoC Quick Scoring Device as both raw scores and percentiles. Raw scale scores will be tabulated for each of the 7 subscales and converted to percentiles. In order to determine the range of peak scores within the faculty, the number of individuals scoring high on each stage will be tallied. Then, individual data will be aggregated to deduce the mean scores for each stage. This will provide information as to the dominant high and low stages of concern of the faculty that will be interpreted based on the definitions of the Stages of Concern. To provide additional insight into the faculty's stages of concern, the second highest stage scores for the group will be analyzed to determine if the second highest Stage of Concern is adjacent to the peak Stage. This pattern of highest and second highest stages of concern being adjacent is related to the developmental nature of concerns often associated with innovations.

Discussion

Many factors impinge on faculty's movement through the stages of concern. This progression requires more than knowledge of the innovation, time to use the innovation, and successful experiences with the innovation. Faculty movement through the stages is highly personal and impacted by faculty capabilities and other demands on their time (Wilkinson, 1997). Providing hands-on workshops and one-on-one assistance will foster movement through the stages for most faculty. However, for some faculty their " history, dynamics, and capabilities may make resolution of certain concerns nearly impossible" (Hall, George, & Rutherford, 1977, p. 15). Hence, every faculty member is not expected to progress through all of the stages. Support must be provided to them at their stage of development, as they learn to use their office computers with Internet access and the other technology available to support their teaching.

Determining the faculty stages of concern and providing support as they learn to use the new technology is the first step. The next step will be having them integrate technology into their classrooms. Realizing, as have others (Roberts & Ferris, 1994), that the acquisition of computers and using them for personal benefit is only the beginning, an ongoing area of focus will be on working with faculty to integrate technology into their classroom teaching. Teachers' self-perceptions of their expertise are highly correlated with the implementation of technology into their teaching (Harvey, Kell, & Drexler, 1990). If faculty are to integrate technology into their classes, they must feel comfortable using the technology. According to Roberts and Ferris (1994) this takes approximately 1,000 hours of training. Training, support, time, and leadership are necessary for the successful integration of technology into classrooms. Technology integration into classes will require faculty who feel comfortable using the technology, as well as changes in their teaching methods, and changes in their roles as teachers.

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